

Computational Appliance for Rapid Prediction of Aircraft Trajectories, Phase I

Completed Technology Project (2007 - 2007)



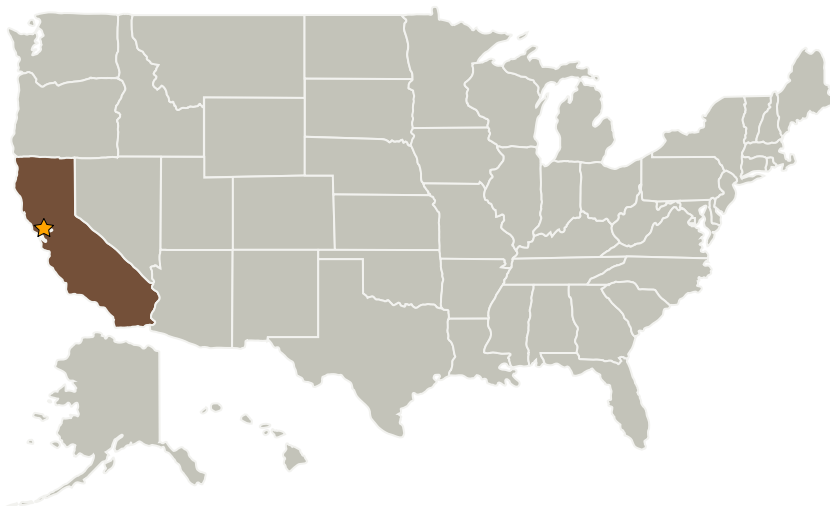
Project Introduction

Next generation air traffic management systems will be based to a greater degree on predicted trajectories of aircraft. Due to the iterative nature of future air traffic management computations, the success of these systems will depend strongly on the ability to rapidly generate trajectory predictions. This proposal advances the development of a computational appliance for rapid prediction of aircraft trajectories (CARPAT) that combines the capabilities of the NASA-FACET software with the fast computing capabilities of the emerging field programmable gate array technology. By integrating the FACET software components on commercial, off-the-shelf high-speed computing technology, the proposed research will demonstrate high trajectory prediction speeds at modest cost. Phase I research will demonstrate the feasibility of developing the trajectory prediction appliance using off-the-shelf hardware. High-speed trajectory predictions will be demonstrated under realistic traffic scenarios. A complete version of the system will be developed and provided to NASA during the Phase II work. The trajectory prediction appliance will be commercialized during the Phase III work.

Anticipated Benefits

Potential NASA Commercial Applications: The CARPAT system developed under the proposed research will contribute towards the development of next-generation air traffic management technologies. The computational appliance and its architecture have several applications in flight simulation, space vehicle and UAV guidance, and in real-time signal processing.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Optimal Synthesis, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Los Altos, California

Primary U.S. Work Locations

California

Project Transitions

**January 2007:** Project Start**July 2007:** Closed out**Closeout Summary:** Computational Appliance for Rapid Prediction of Aircraft Trajectories, Phase I Project Image

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Padmanabhan K Menon

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.2 Flight Mechanics
 - └ TX15.2.1 Trajectory Design and Analysis